

كتاب

4

# الجمهورية التعليمية



المراجعة النهائية  
وأهم التوقعات

علوم - جبر وإحصاء  
وهندسة (لغات)

للشهادة الإعدادية

«الامتحان بين ايديك»

Science

الصف  
25  
خبر

# *Final Revisión*

Science



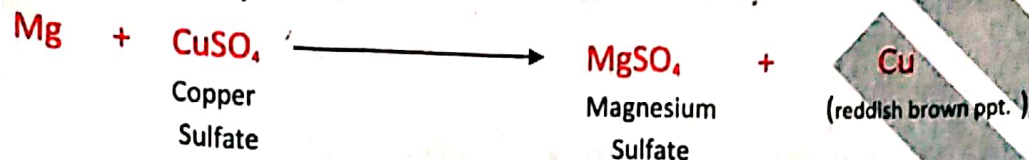
## Unit one

Concept	Defnition
<b>Chemical reaction</b>	It is the breaking down of bonds between reactants and forming new bonds between products (resultants)
<b>Thermal decomposition</b>	It is a kind of chemical reactions in which the compound is broken up by heat.
<b>Double substitution reaction</b>	The reactions which involve double substitution occur between the ions (Radicals) of two compounds to give two other new compounds.
<b>Neutralization Reaction</b>	Reaction between an acid and an alkali to produce salt and water.
<b>An oxidizing Agent</b>	The material that gives oxygen or takes hydrogen away during chemical reaction
<b>A reducing agent</b>	The material that takes oxygen away or gives hydrogen during chemical reaction.
<b>An oxidizing agent</b>	The substance that gains one electron or more during a chemical reaction
<b>A reducing agent</b>	The substance that loses one electron or more during a chemical reaction
<b>Speed of chemical reaction</b>	The change in the concentration of the <sup>reactants</sup> reaction and resultants at a time unit <sup>time</sup>
<b>catalysts</b>	A substances which speed up the chemical reaction without sharing in it or being used up .



**Give reasons for:****1. Magnesium substitute copper in copper sulfate solution forming magnesium sulfate and copper precipitates.**

- Because magnesium is more active than copper as they come before Cu in chemical activity series

**2. The rate of reaction of HCl with iron filling is faster than the one piece of iron**

- Because the area exposed to the reaction in case of iron filling is bigger than that in case of the piece of iron.

**3. Using molecule nickel in hydrating oil instead of pieces of nickel .**

- Because the area exposed to the reaction in case of nickel molecule is bigger than that in case of piece of nickel so the reaction of nickel molecule is faster .

**4. The fridge is used to preserve food.**

- Because of the chemical reactions done by bacteria, cooling food at low temperature slows down those reactions.

**5. Covalent compounds are slow in reacting .**

- Because they don't break up in ions, but the reactions are between molecules.

**6. Ionic compounds are fast in reaction .**

- Because they break up in ions and the reaction occur between the ions.

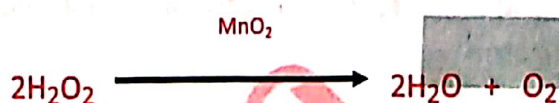
<b><u>Oxidation</u></b>	<b><u>Reduction</u></b>
It is a chemical process which causes the increase of the oxygen percentage or the decrease of hydrogen percentage.	It is a chemical process which causes the decrease of the oxygen percentage or the increase of hydrogen percentage.
It is a chemical process in which atom loses one electron or more.	It is a chemical process in which an atom gains one electron or more.



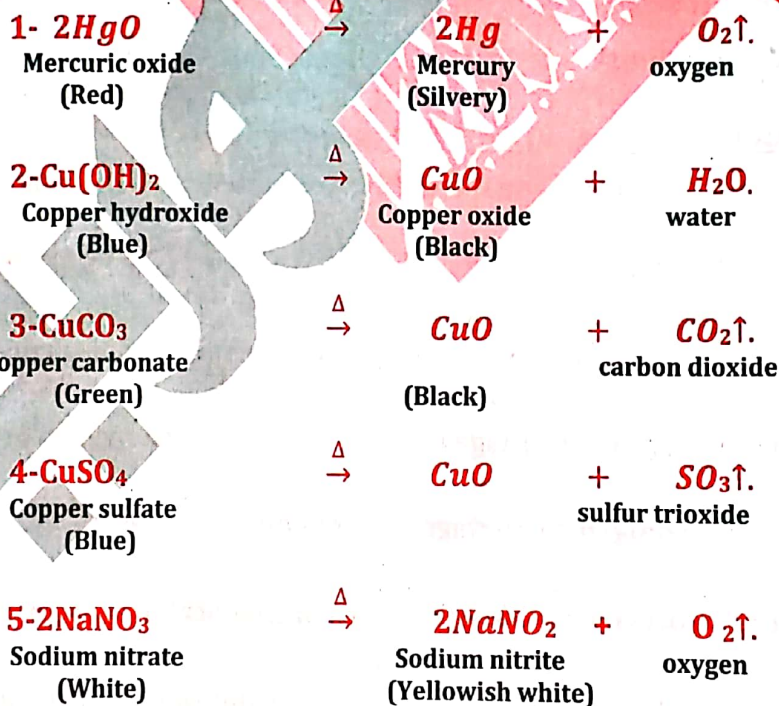
**Factors affecting the speed of chemical reaction:**

1. The nature of reactants. (Bond – Surface area)
2. The concentration of reactants
3. The temperature of reactants *reaction*
4. Catalysts.

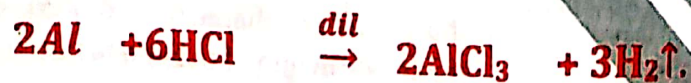
A- Using manganese dioxide as catalyst in breaking up of hydrogen peroxide to prepare oxygen gas in laboratory.



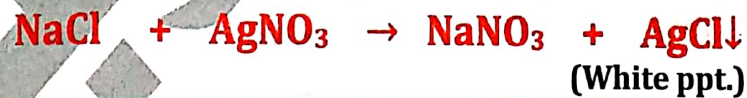
B . The effect of enzymes on speed of chemical reaction.

**Important Chemical equations****Thermal decomposition reaction**



**Simple substitution**

(Reddish brown)

**Double substitution**

(White ppt.)



## Unit two

Concept	Definition
<b>Current intensity</b> <del>It is the electric current intensity</del> <i>Passing through a circuit when a quantity of charge of 1 coulomb passes through a given cross-section in time of one second</i> <b>Ampere</b>	It is the quantity of the electric charges flowing through Across section of the conductor on one second.
<b>Volt</b>	It is the potential difference between the two poles of A conductor on a work of 1 joule to transfer a quantity of Electricity (1 coulomb).
<del>X</del> <b>Joule</b>	It is the amount of work done by a force of 1 Newton moving an object through a distance of 1 meter.
<b>Coulomb</b>	It is the charge transferred by a constant current of one <i>quantity</i> ampere in one second. <i>intensity</i>
<b>Electromotive Force (emf)</b>	It is the electric potential difference between the two poles of the battery when the electric circuit is open.
<b>The electric Resistance</b>	It the <i>obstruction</i> that the electric current faces during its <i>opposition</i> movement in a conductor.
<b>Ohm</b>	It is the resistance of the conductor that has an electric current passing through it with strength of 1 ampere and when the p.d between it poles is 1 volt.
<b>Ohm's law</b>	The electric current passing through a conductor is directly proportional with a potential difference between its ends when temperature is constant.
<b>Potential Difference</b>	It is the work done to transfer a quantity of charges between two points of a conductor .
<b>The electric Potential of Difference</b> <i>a conductor</i>	The state of an electric conductor that shows the transfer of the electricity to and from it when it is connected to another conductor.



**Give reasons for:****1. The alternating current is preferred than the direct current .**

- Because, it can be transmitted for long distances, it can be changed into direct current and it is used in operating many electric appliances.

**2. We connect dry cells in both series and parallel .**

- To obtain different values of e.m.f.

**3. Ampere is not connecting directly to the battery.**

- Because this damage it .

**4. The rheostat connected in series in an electric circuit .**

- To control the current intensity through the circuit .

**5. The voltmeter is connected across the two poles of battery .**

- To measure the electromotive force of the battery .

**6. Some cells are connected in the electric circuit in series .**

- To obtain high e.m.f.

**What happens when?****1. Two conductors have the same electric potential are connected by wire .**

- No electric current will pass through them, because there is no potential difference between them .

**2. The length of rheostat wire which exists in the circuit increases .**

- The resistance increases and the current intensity decreases.

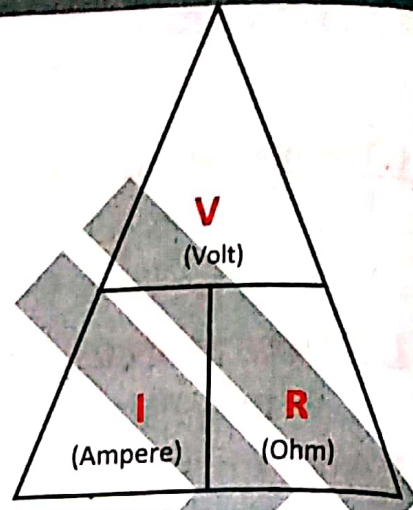
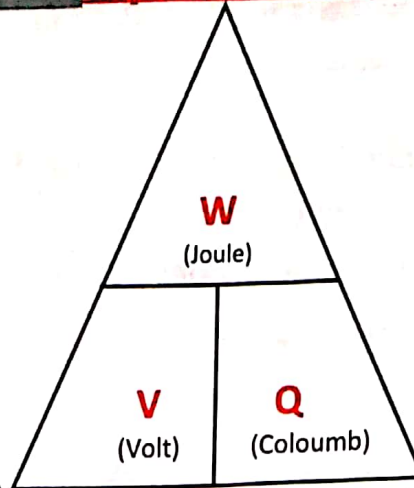
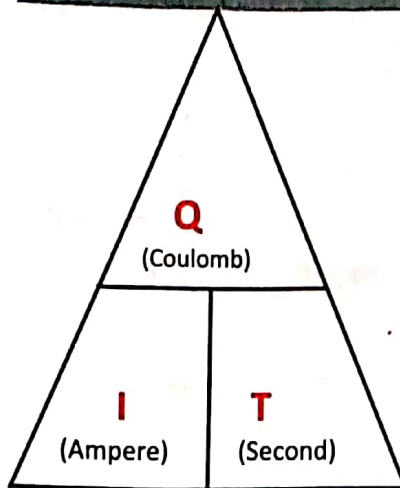
**3. The circuit of ohms law doesn't contain variable resistance.**

- The current intensity and the potential difference cannot be controlled and it doesn't verify ohms law .

**4. A group of electric cells are connected in series.**



- The total e.m.f. increases.





**Important laws**

Point of Comparison	Direct current (D.C)	Alternating current (A.C)
Direction	Unidirectional	Variable
Intensity	Constant	Variable
Source of Produce	Electrochemical cells ( Dry cell – Battery )	Electric generator ( dynamo )
Changes	Cannot be changed into alternating current	Can be changed into Direct current
Uses	-Electroplating -Electrolysis	-Lightning houses -Operating electric appliances.
Graph	<p>A graph with current <b>I</b> on the vertical axis and time <b>T</b> on the horizontal axis. The line is a horizontal straight line, indicating constant current over time.</p>	<p>A graph with current <b>I</b> on the vertical axis and time <b>T</b> on the horizontal axis. The line is a sinusoidal wave, indicating alternating current over time.</p>



<b>Ammeter</b>	<b>Voltmeter</b>
1- It is used in measuring the electric current intensity.	1- It is used in measuring the potential difference and the electromotive force (e.m.f.).
2- It is given by the symbol 	2- It is given by the symbol 
3- Its connection is <b>series</b> in the circuit.	3- Its connection is <b>parallel</b> in the circuit.
4- Its measuring unit is ampere.	4- Its measuring unit is volt.

**Important uses**

<b>Apparatus</b>	<b>Uses</b>
<b>Ammeter</b>	Measuring the electric current intensity
<b>Voltmeter</b>	Measuring electric potential and electromotive force 
<b>Ohmmeter</b>	Measuring electric resistance
<b>Rheostate</b>	Control the electric current intensity and potential difference. 
<b>Catalyst</b>	Speed up the rate of chemical reaction.

### Lesson 3

## Radioactivity and nuclear energy

- Radioactivity was discovered by **Henri Becquerel**.

### Radioactive elements

They are elements whose atom's nuclei contain a number of neutrons more than the required for its stability.

### \* Examples of radioactive elements:

- Radium - uranium - cesium - zirconium

### Radioactivity phenomenon

It is more decaying of the nuclei of radioactive elements in an attempt to achieve a more stable composition.

### G.R. The nuclei of radioactive elements are unstable.

Due to their excess energy because the number of neutrons is more than the number required for its stability.

### Types of radioactivity:

**1. Natural radioactivity:** spontaneous decaying of the nuclei of achieves a more stable composition.

**2. Artificial radioactivity:** it is the inducing (not spontaneous) radiation or nuclear energy.

### The peaceful uses of nuclear energy

The field	The use
<b>1. Medical field</b>	To treat and diagnose diseases like cancer.
<b>2. Agricultural field</b>	To eliminate pests.
<b>3. Industrial field</b>	To convert sand to silicon sheets.
<b>4. Electricity General field</b>	The nuclear energy is used to heat water to produce steam. This steam is used to operate turbines to and generate electricity.



## The radiation effects on the human body

### 1. Exposure to a large dose of radiation for a short time.

- This will lead to the damage of:

- \* Bone marrow
- \* Digestive system
- \* spleen
- \* central nervous system

### 2. Exposure to a small dose of radiation for long time.

- The most important effects are :

- a. physical effects: Changes the appearance of human.
- b. genetic effects: changes in the sex chromosomes composition.
- c. cellular effects: changes in the cells composition.

## Measuring the radiation

- The measuring unit for radiation absorbance is the Rem \* Sievert (sv)
- The maximum safe dose of nuclear radiation should not exceed (5 rem) for humans in one day.
- The safe dose of nuclear radiation:
  - a) For radiologist is 20 milli sievert per year
  - b) for Public is 1 milli sievert per year

## Means of protection from radiation pollution

1. Not to be exposed to the maximum safe doses of nuclear radiation.
2. The worker with radioactive elements in labs and hospitals should wear radiation protective gloves, clothes and masks.
3. Nuclear wastes of weak and medium radiation are surrounded by cement layer or rocks and are placed deep inside the ground.
4. Nuclear wastes of strong radiation are cooled using water, than they are deeply.





## **Unit three**



Concept	Definition
<b>Genetics</b>	It is a branch of science that studies the inheritance of characters through generations to explain how the similarities and differences appear between individuals of the same species.
<b>Gametes</b>	They are reproductive cells that carry the hereditary factors of both parents and they are called sperms in the male of animals.
<b>Gene</b>	They are parts of DNA present on the chromosomes and control the individual hereditary traits.
<b>Mendel's first law (law of segregation of factors)</b>	When two individuals of any pure pair of alleomorphic character differ from one to another, after crossing only one character appears in first generation, then the two characters appear together in second generation by the ratio 3:1
<b>Mendel's second law (law of independent assortment of hereditary factors)</b>	If two individuals that are different in two pairs or more of alternative (contrasting) traits copulate, the trait of each pair is inherited independently and appears in the second generation at a ratio of 3:1



<b>Hereditary traits</b>	Traits are transmitted from one generation to another
<b>Acquired trait</b>	Traits are not transmitted from one generation to another

<b>Dominant character</b>	<b>Recessive character</b>
<ul style="list-style-type: none"> <li>- It is pure or hybrid</li> <li>- It appears when two similar factors for dominant character aggregate or when one factor for dominant character and the other of recessive character aggregate.</li> <li>- It appears with a ratio 100% in the <math>F_1</math> and a ratio 75% in the <math>F_2</math></li> </ul>	<ul style="list-style-type: none"> <li>- It is always pure</li> <li>- It appears when two similar factors for recessive character aggregate.</li> <li>- It disappears in the first generation and appears with a ratio 25% in the second generation.</li> </ul>

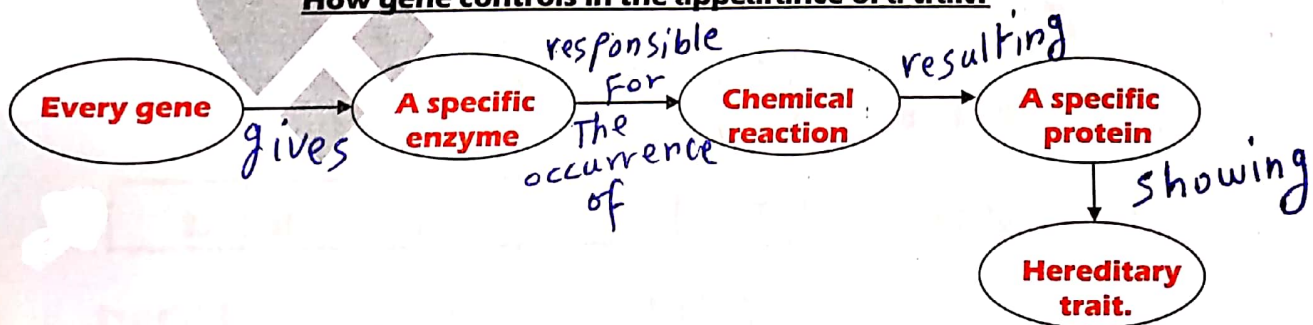
### **Watson and Creek**

- Make the first model of DNA

( composed of two strands coiled around each other like the spiral ladder or called "double helix". )

### **Badel and Tatum**

**How gene controls in the appearance of a trait?**



**Give reasons for :****1. Mendel selects the pea plant to conduct his experiment.**

- Due to:
  - It is easy to the pea plant and it grows fast
  - It produces large numbers of plants in a generation.
  - Its life cycle is short.

**2. The ability of bending the tongue is dominant trait in the human being.**

- Because the gene of the ability to bend the tongue dominant over the gene of the non- ability to bend the tongue if they are both present in an individual.

**3. The separate ear lobe is dominant over adhere ear lobe.**

- Because the gene of separate ear dominates over the gene of the adhered ear lobe if they are both present in the individual.

**Examples**

**When a pea plant that has pure tall stem (TT) is crossed with a pea plant that has short stem (tt). Parents.**

**Parent**

**TT** × **tt**

**Segregation Gametes**

**T**      **t**

**First generation**

**Tt**

**Ratio**      **100% are of hybrid long stems**

**When the planes of the first generation are left to self-pollination.**

**Parent**

**Tt** × **Tt**

**Segregation Gametes**

**T**   **t**      **T**   **t**

**Second generation**

**TT** : **Tt** : **Tt** : **tt**

**3 Tall** : **1 Short.**



**EX 2:** Explain on the base of genetic principles crossing between two pea plants of hybrid smooth seeds. (Knowing that smooth seeds trait (R) is the dominant and wrinkled seeds trait (r) is recessive.

The hybrid smooth seeds are represented by (Rr).

Parent

**Rr** × **Rr**

Segregation Gametes

**R** **r**      **R** **r**

Second generation

**RR** : **Rr** : **Rr** : **rr**

**3 smooth seeds: 1 wrinkled seeds.**

**EX3:** If crossing takes place between two pea plants, one of them of hybrid green fruit (Gg) and the other of yellow fruits (gg). Explain of the base of genetic principles the results of such crossing. Mention the ratio of produced offspring.

Pea plant of green  
Fruits (hybrid)

Pea plant of yellow  
fruits (pure)

Parent

**Gg** × **gg**

Segregation Gametes

**G** **g**      **g** **g**

Second generation

**Gg** : **Gg** : **gg** : **gg**

Pea plant of  
green fruits

Pea plant of  
yellow fruits

**50%**

:

**50%**

**1**

:

**1**

Ratio:

**EX4:** If crossing takes place between two pea plants, one of them of Tall stem and red flower (TTRR) and the other of short stem and white flower (ttrr). Explain the base of genetic principles the results of such crossing. Mention the ratio of produced offspring.

**Parent**

Pea plant of Tall stem Red flower **TTRR** × Pea plant of short stem white flower **ttrr**

**Segregation Gametes**

**TR** **TR** × **tr** **tr**

**First generation**

**TtRr** : **TtRr** : **TtRr** : **TtRr**

**Parent 2**

Pea plant of hybrid Tall stem Red flower **TtRr** × Pea plant of hybrid Tall stem Red flower **TtRr**

**Gametes 2**

**TR** **Tr** **tR** **tr** × **TR** **Tr** **tR** **tr**

**Second generation**

Male / Female	<b>TR</b>	<b>Tr</b>	<b>tR</b>	<b>tr</b>
<b>TR</b>	TTRR	TTRr	TtRR	TtRr
<b>Tr</b>	TTRr	TTrr	TtRr	Tttr
<b>tR</b>	TtRR	TtRr	ttRR	ttRr
<b>tr</b>	TtRr	Tttr	ttRr	tttr

<b>TR</b>	<b>Tr</b>	<b>tR</b>	<b>tr</b>
Tall stem Red flower	Tall stem White flower	Short stem Red flower	Short stem White flower
9	3	3	1

**Tall stem : Short stem**

12 : 4

3 : 1

**Red flower : White flower**

12 : 4

3 : 1



**The dominant and recessive traits in the human being:**

Trait	Dominant	Recessive
Hair color	Black	Light
Hair	Curly	Straight
Eye color	Black	Green or Blue
Eye	Wide	Narrow
Rolling tongue	Rolling tongue	Can't Rolling tongue
Ear lobe	Free	Attach
Freckles النمش	No Freckles	Freckles



Figure (4): The ability to roll the tongue is of the dominant traits in the human being



Figure (5): The separate ear lobe dominates the connected ear lobe trait



Figure (6): The wide eyes trait dominates the narrow eyes trait

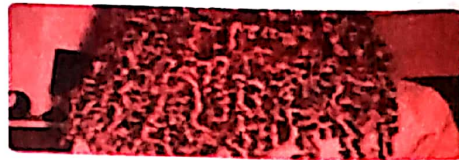


Figure (7): The curly hair trait dominates the straight hair trait

















Figure (8): The presence of dimples in the face trait dominates the no dimples trait



Figure (9): The non-presence of freckles in the face trait is the dominant trait and the presence of freckles is the recessive trait

**The dominant and recessive traits in the Pea plant:**

Genetics of Pea Plants							
Traits	Seed Shape	Seed Color	Pod Shape	Pod Color	Flower color	Flower Position	Stem Height
Controlled by dominant Allele	 Round	 Yellow	 Smooth	 Green	 Purple	 Side	 Tall
Controlled by Recessive Allele	 Wrinkled	 green	 pinched	 yellow	 white	 end	 Short



## **Unit four**

Concept	Definitlon
<b>Hormones</b>	It is a chemical substance that controls and organizes vital activities and functions in the bodies of living organisms.
<b>Endocrine Glands</b>	<del>they are ductless glands that secrete their</del> They are the organs that secrete the hormones in the human body. <del>hormones directly in blood without passing through ducts</del>
<b>Hormone Disorder</b>	It is the disorder that resulted when one of the endocrine glands does not work properly.
<b>Gigantism</b>	It occurs due to increase of secretion of growth hormone at the childhood.
<b>Dwarfism</b>	It occurs due to decrease of secretion of growth hormone at the childhood.
<b>Simple goiter</b>	A disease that occurs due to decrease of secretion of thyroxin hormone.
<b>Exophthalmic Goiter</b>	A disease that occurs due to increase of secretion of thyroxin hormone with large amount.
<b>Diabetes</b>	A disease that occurs due to decrease of secretion of Insulin hormone.



**Give reasons for:****1. The pituitary gland is called the master gland or the main gland.**

- Because it secretes hormones that regulate the activities of other endocrine glands.

**2. Pancreas is a double function gland.**

- Because the pancreas secretes the insulin and glucagon hormones and they have opposite function in regulating the sugar level in the blood.

**3. Thyroxin hormone can be named the activity hormone.**

- Because it plays a main role in food assimilation process in the body which produce energy.

**4. Some persons have enlarged thyroid gland.**

- Due to decrease or increase of secretion in thyroxin hormone.

**5. The height of some persons may exceed 2 meter.**

- Due to the increase in the growth hormone secretion.

**What happen when ?****1. Adrenalin hormone is secreted in a very little amount.**

- The body organs don't respond to emergencies.

**2. Glucose sugar level is decreased in blood.**

- Pancreas secretes glucagon hormone into blood stream and it affects the liver to increase the assimilation rate of stored glucose inside it.

**3. The pancreas decreases its secretion of glucagon hormone.**

- The level of glucose sugar in blood decreases.

**4. The secretion of growth hormone is increase at childhood.**

- Man will suffer from gigantism.

**5. The secretion of growth hormone is decrease at childhood.**

- Man will suffer from dwarfism.

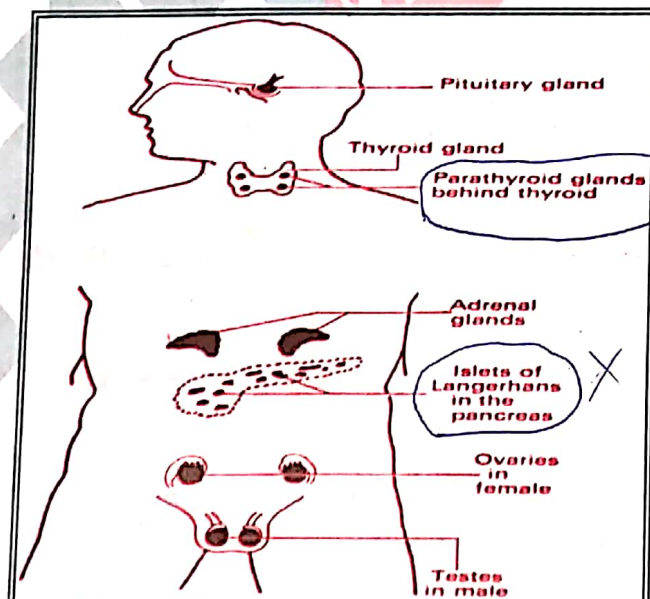
**6. The secretion of thyroxin hormone is increase.**

- Man will suffer from exophthalmic goiter.



**Some diseases resulted from the harmonic unbalance in human body**

<b><u>Disease</u></b> <b><u>(hormone</u></b> <b><u>disorder)</u></b>	<b><u>Description</u></b>	<b><u>Reasons</u></b>
<b><u>Dwarfism</u></b>	The body stop growing	Decrease the secretion in growth hormone
<b><u>Gigantism</u></b>	A continuous growth in the limbs bones	Increase the secretion in growth hormone
<b><u>Simple goiter</u></b>	Enlargement of thyroid gland and the neck	Decrease of secretion in the thyroxin hormone Due to lack of iodine from food
<b><u>Exophthalmic goiter</u></b>	Enlargement of thyroid gland and loss of weight	Increase of secretion in the thyroxin hormone with large amount
<b><u>Diabetes</u></b>	Cells disability to use glucose sugar	Decrease in the secretion of insulin hormone from pancreas





**Some hormones of endocrine glands and their functions:**

<u>Gland</u>	<u>Hormones</u>	<u>Function</u>
<u>Pituitary</u>	<ul style="list-style-type: none"> <li>- <u>Growth hormone</u></li> <li>- Thyroid stimulating hormone</li> <li>- The activating hormones of sexual glands</li> </ul>	<ul style="list-style-type: none"> <li>- regulates the growth of the body as a whole</li> <li>- stimulates thyroid gland to secrete its hormones</li> <li>- affect the development of sex organs prior to adulthood stage</li> </ul>
<u>Thyroid</u>	<ul style="list-style-type: none"> <li>- <u>Thyroxin</u></li> <li>- <u>Calcitonin</u></li> </ul>	<ul style="list-style-type: none"> <li>- Liberates the energy necessary for the body from food.</li> <li>- controls the calcium and phosphorus level in the blood</li> </ul>
<u>Adrenal</u>	<u>Adrenalin</u>	Stimulates body's organs to respond to emergencies
<u>pancreas</u>	<ul style="list-style-type: none"> <li>- <u>Insulin</u></li> <li>- <u>Glucagon</u></li> </ul>	<ul style="list-style-type: none"> <li>- Stimulates the storage of glucose sugar in liver</li> <li>- Stimulates the release of glucose sugar from the liver</li> </ul>
<u>The two ovaries (female)</u>	<ul style="list-style-type: none"> <li>- <u>Estrogen</u></li> <li>- <u>Progesterone</u></li> </ul>	<ul style="list-style-type: none"> <li>- produces the female secondary sex characteristics</li> <li>- promotes the growth of endometrium.</li> </ul>
<u>The two testes (male)</u>	<u>Testosterone</u>	Produces the male secondary sex characteristics



**Final Revision****1- Complete the following:**

- 1- Sodium nitrate is decomposed by heat into ..... and .....
- 2- Hormones are directly secreted into the blood stream by .....
- 3- Thyroxin is a .....that regulates food assimilation in your body.
- 4- The process of losing an electron or more is called .....
- 5- In .....reactions the compound is decomposed into its initial elements by heating.
- 6- Substance that gives oxygen or removes hydrogen is called .....
- 7- In the beginning of the reaction , the concentration of the reactions is ..... %
- 8- Covalent compounds are ..... in their reactions.
- 9- When the secretion of the growth hormone decreases at the childhood, Man is infected by.....
- 10- The rate of chemical reaction is ..... by increasing the temperature.
- 11- The measuring unit of the quantity of electricity is .....
- 12- The measuring unit of the resistance of conductor is .....
- 13- .....apparatus is used to measure the resistance in the circuit but ..... is used for measuring potential difference and electromotive force.
- 14- The rate of chemical reaction is depend on ..... and .....
- 15- Dry cells produce .....current while electric generators produce ..... current.
- 16- Electric current is generated in dynamo as a result of change ..... energy into ..... energy.
- 17- Copper hydroxide is decomposed by heat to ..... and .....
- 18-  $\text{CuCO}_3 \rightarrow \dots + \dots$
- 19-  $2\text{Al} + 6\text{HCl} \rightarrow 2\text{AlCl}_3 + \dots$
- 20- .....enzyme from examples of catalyst that used to decompose hydrogen peroxide in to water and oxygen.



- 21- Chemical reaction is ..... in the reactant molecules and ..... in the product molecules.
- 22- The symbols of the dominant trait is ....., while the recessive one is .....
- 23- Nuclear energy is used in medicine in ..... and .....
- 24- On passing hydrogen gas over hot copper oxide, copper oxide is converted into .....
- 25- On adding silver nitrate solution to sodium chloride solution, a white precipitate of ..... is formed.
- 26- Nuclear energy is used in space exploration as .....
- 27- The resistance faces the flow of electric current in a conductor is known as.....
- 28- Types of resistance are ..... and .....
- 29- ..... electric potential difference between the two poles of the battery when the electric circuit is open.
- 30- ..... is the resistance of the conductor that has an electric current passing through it with strength of 1 ampere and when the p.d between its poles is 1 Volt.
- 31- The ..... effects of radiation is a result of changing the sex chromosomes of the cells.
- 32- The measuring unit of absorbed radiation is the.....
- 33- Genetic traits are transmitted through .....
- 34- Oxidation and reduction are two ..... processes.
- 35- There are two types of electric current, ..... and .....
- 36- If the length the wire increases, the resistance ..... and the current intensity.....
- 37- ..... traits are not transmitted from one generation to another.

- 38- The scientist ..... is the founder of heredity, he used the seeds of ..... plant, because its flowers are ..... and thus it can self-pollinated.
- 39- The two scientists ..... and ..... were able to make a model for DNA molecule.
- 40- ..... explains how is the gene work?
- 41- ..... is the part of DNA in the cell nucleus.
- 42- DNA molecule consists of ..... strands.
- 43- Cell produce ..... current while the dynamo produces ..... current.
- 44- Mendel conducted his experiments in pea plant by using ..... pairs of traits.
- 45- The value of the current intensity can be changed (controlled) by using ..... apparatus.
- 46- It is necessary not to be exposed to a radiation more than ...**milli sievert** per year for human body.
- 47- The exposure to the small amount of radiation resulted in a cellular effects as.....
- 48- Physical effects take place as a result of the exposure to ..... amount of radiation.
- 49- Bone marrow can be destroyed as a result of exposure to ..... amount of radiation for ..... periods.
- 50- ..... is from the radioactive elements.
- 51- Genes are found in the ..... of cell.
- 52- The ..... trait appears in the first generation only, while the ..... appears in the second with a percentage 25 %.
- 53- The ..... hormone is secreted when the rate of glucose sugar increases in the blood.
- 54- When the amount of glucose decreases in blood, pancreas secretes ..... hormone



- 55- .....is measured by using the Voltmeter and has a measuring unit known as .....
- 56- The .....is used to measure the electromotive force of a battery in units known as .....
- 57- While connecting charged conductors, the electric current passes from the conductor have .....potential to the conductor have .....potential.
- 58- The electric current generated from a dynamo is due to converting .....energy to .....energy.

## **2- Write the scientific term:**

- 1- A substance that lose one electron or more during a chemical reaction.
- 2- The breaking up bonds between molecules of reactants and formation of new bonds.
- 3- Reaction of acid and base to give salt and water.
- 4- Reaction involves replacing a metal by another one in its salt solution.
- 5- Change in the concentration of the reactants and products per unit time.
- 6- Substance that accelerate the rate of reaction and not participate in it.
- 7- Electric current intensity is directly proportional to potential difference between two terminals of a conductor at constant temperature.
- 8- An apparatus used to measure electromotive force.
- 9- The state of a conductor that determine the transfer of electricity from or to it.
- 10- The resistance that faces the electric current during the passing a conductor.
- 11- The unit that used to measure the absorbed radiation.
- 12- Spontaneous conversion of the atoms of same naturally occurring elements trying to reach a more stable structure.
- 13- Flow the electric charge through a conductor.
- 14- The obstruction that the electric current faces during its movement in a conductor.
- 15- It is the resistance of a conductor which allows the passing of an electric current its intensity is one ampere and potential difference between its two terminals in one Volt.

- 16- It is the current intensity passing through conductor whose resistance is one ohm and potential difference between its poles is one volt.
- 17- It is potential difference between the two poles of a conductor whose resistance is one ohm and its current intensity passing through it is one ampere.
- 18- The result when one of the endocrine glands does not work properly.
- ✓ 19- The amount of work done by a force of 1 Newton moving an object through a distance of 1 meter.
- 20- The substance that gains one electron or more during a chemical reaction.
- 21- The change in the concentration of the reactants and resultants at a time unit.
- 22- Arrangement of elements in a descending order due to their chemical activity.
- 23- They are the reactions which involve double exchange occurs between radicals.
- 24- Atoms of the same element with the same protons and with different number of neutrons.
- 25- The trait that appears in all individuals of the first generation in Mendel's experiments.
- 26- It is chemically consisted of a nucleic acid called DNA combined with protein.
- 27- The traits ready to be transmitted from one generation to another.
- 28- The potential difference across the two poles of the battery when the circuit is opened.
- 29- The electric current of constant intensity and direction.
- 30- A type of connection of electric cells used to obtain high e.m.f.
- 31- The process of conversion of atoms of some elements to reach more stability.
- 32- The changes that take place to the living organism due to its exposure to radiations.
- 33- Parts of DNA that is present on the chromosomes and carry the hereditary traits of individual
- 34- The hereditary factors which transmit traits from the parents to off spring.
- 35- Through which the hereditary traits are transmitted from parents to offspring.
- 36- The unit that used to measure the absorbed radiation.
- 37- The opposition that faces the electric current during the passing a conductor



38- Mechanism with which hormones work to achieve the homeostasis balance in the human body.

39- ~~Ductless glands~~ Organs secreting hormones in the human body.

40- A gland that secretes a hormone that regulates the growth of human sexual organs.

41- A disease caused by the increase of thyroxin hormone after the adulthood.

42- A chemical message that controls and regulates the activities and functions of most of the body organs.

### B- Compare between:

Point of comparison	Series	Parallel
Electromotive force		

Point of comparison	Ionic compounds	Covalent compounds
Rate of reaction		

Point of comparison	Direct current	Alternating current
Source		
Uses		

Point of comparison	Current intensity	Potential difference	Electric resistance
Apparatus			
Unit			

### 3) Choose the correct answer:-

1- In thermal decomposition reactions, the compound is decomposed into .....

- a- its simple components
- b- its primary elements.
- c- other compounds
- d- all the previous

2- On heating red mercuric acid , it decomposes into .....

- a- oxygen
- b- mercury
- c- oxygen and mercury
- d- no correct answer

3- Heating of metal hydroxide produces .....

- a- metal oxide only
- b- metal oxide and  $\text{CO}_3$
- c-  $\text{CO}_2$  gas only
- d- no correct answer

**4- Copper sulphate is decomposed by heat into .....**

- a- black copper oxide only
- b- sulfur trioxide gas only
- c- sulfur dioxide gas and copper dioxide
- d- black copper oxide and sulfur trioxide gas.

**5- Some metal nitrates are decomposed by heat into .....**

- a- metal nitrite and oxygen gas
- b- metal nitrate and oxygen gas
- c- nitrogen oxide and oxygen gas
- d- no correct answer

**6- Blue copper hydroxide is decomposed by heat into .....**

- a- copper oxide and oxygen
- b- copper oxide and water vapor
- c- copper and water vapor
- d- (a and c) are correct

**7- The descending arrangement of metallic elements according to their chemical reactivity is called .....**

- a- Chemical activity series
- b- (+ve) ions
- c- (-ve) ions
- d- free atoms

**8- Active metals replace hydrogen of water and produce ..... and hydrogen gas evolved**

- a- metal hydroxide
- b- metal oxide
- c- metal carbonate
- d- metal sulphate

**9- Active metals replace hydrogen of water producing metal hydroxide , ..... gas evolved.**

- a- carbon dioxide
- b- hydrogen
- c- nitrogen
- d- oxygen

**10- Metal replaces hydrogen of the acid and ..... gas is evolved.**

- a- nitrogen oxide
- b- carbon dioxide
- c- hydrogen
- d- oxygen

**11- Zinc reacts with dilute hydrochloric acid and ..... salt is formed.**

- a- zinc chloride
- b- zinc sulphate
- c- zinc nitrate
- d- no correct answer

**12- Potassium reacts with dilute hydrochloride acid forming ..... salt**

- a- potassium nitrate
- b- potassium sulphate
- c- potassium chloride
- d- no correct answer

**13- On adding copper turning to dilute hydrochloride acid ..... is produced.**

- a- copper hydroxide
- b- copper carbonate
- c- copper chloride
- d- no reaction

**14- Some metals can replace another one in the solution of these metals which.....**

- a- follow it in chemical activity series
- b- after it in chemical activity series
- c- (a and b) are correct
- d- no correct answer

**15- When magnesium replaces copper in its salt solution a .....Precipitate formed.**

- a- black
- b- red
- c- reddish
- d- no correct answer



- 16- Double substitution reactions are classified into .....  
 a- acid and alkali reaction  
 c- reaction of water and acid  
 b- reaction of an acid with a salt  
 d- all the previous.
- 17- The acid reacts with an alkali producing .....  
 a- salt and water  
 c- salt and oxygen gas  
 b- salt and hydrogen gas  
 d- no correct answer
- 18- When potassium hydroxide reacts with hydrochloric acid ..... are produced  
 a- potassium chloride and water  
 c- potassium oxide and water  
 b- potassium sulphate and water  
 d- all the previous
- 19- Hydrochloric acid reacts with sodium carbonate powder forming .....  
 a- sodium chloride and oxygen gas  
 c- sodium oxide and water  
 b- sodium chloride and CO<sub>2</sub> gas  
 d- all the previous
- 20- Clear lime water turbid on passing ..... gas through it  
 a- nitrogen dioxide  
 c- carbon dioxide  
 b- sulfur dioxide  
 d- (a and b) are correct
- 21-  $\text{Cu(OH)}_2 \rightarrow \dots + \dots$   
 a-  $\text{CuO} + \text{H}_2\text{O}$   
 c-  $\text{Cu} + \text{H}_2\text{O}$   
 b-  $\text{CuO} + \text{H}_2$   
 d- no correct answer
- 22-  $2\text{NaNO}_3 \rightarrow \dots + \dots$   
 a-  $\text{NaNO}_3$   
 c-  $\text{NO}_2 + \text{O}_2$   
 b-  $2\text{NaNO}_2 + \text{O}_2$   
 d- all the previous
- 23- .....  $\rightarrow \text{CuO} + \text{CO}_2$   
 a-  $\text{CuCO}_3$   
 c-  $\text{CuSO}_4$   
 b-  $\text{CuSO}_2$   
 d- all the previous
- 24-  $2\text{Na} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \dots \uparrow$   
 a-  $\text{N}_2$   
 b-  $\text{Cl}_2$   
 c-  $\text{H}_2$   
 d-  $\text{O}_2$
- 25- .....  $+ 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2 \uparrow$   
 a- Zn  
 b- Mg  
 c-  $\text{N}_2$   
 d-  $\text{O}_2$
- 26- When sodium chloride solution reacts with silver nitrate solution....precipitate formed  
 a- red  
 c- raddish  
 b- white  
 d- blue
- 27- On passing hydrogen gas on hot copper oxide, a red precipitate of ..... is formed  
 a- copper  
 c- (a and b) are correct  
 b- copper oxide  
 d- all of previous
- 28- In the reaction of hydrogen with black copper oxide, ..... process take place to copper oxide.  
 a- oxidation  
 c- oxidation and reduction  
 b- reduction  
 d- no correct answer
- 29- The oxidizing agent is the substance that .....  
 a- gives oxygen  
 c- (a and b) are correct  
 b- takes hydrogen  
 d- no correct answer



**30- The reducing agent is substance that .....**

- a- gives oxygen
- c- gives hydrogen

- b- takes oxygen
- d- (b and C) are correct

**31- Reduction is chemical process in which a decrease in the percent of ..... gas**

- a- hydrogen
- c- chloride

- b- oxygen
- d- carbon dioxide

**32- Oxidation is a chemical process in which an increase in the percent of .....gas**

- a- helium
- c- oxygen

- b- hydrogen
- d- fluorine

**33- When sodium atom loses an electron from its outermost energy level, it becomes.....**

- a- oxidized
- c- reduced

- b- reducing agent
- d- (a and b) are correct

**34- Factors that affect the rate of chemical reaction are .....**

- a- concentration of the reactant
- c- temperature

- b- nature of the reactant
- d- all of previous

**35- Iron fillings react with dilute hydrochloride acid faster than a piece of iron has the same mass due to the .....**

- a- increase in concentration
- c- increase in surface area

- b- presence of a catalyst
- d- no correct answer

**36- The rate of chemical reaction is increased by temperature due to .....**

- a- increase the number of collisions between reactants
- b- the presence of covalent bonds
- c- increase of the surface area
- d- no correct answer

**37- Catalyst increases the rate of chemical reaction because it .....**

- a- decreases the energy needed to start the reaction
- b- combines with reactants then separates away to give the products
- c- change chemically
- d- (a and b) are correct

**38- At the beginning of the reaction, the percentage of the reactants concentration = .....**

- a- 100%
- c- 50%

- b- 0%
- d- no correct answer

**39- The intensity of electric current passing through a circuit can be measured by using ..... apparatus.**

- a- pyrometer
- c- voltmeter

- b- barometer
- d- ammeter

**40- For measuring the potential difference between two terminals of a conductor, we use ..... apparatus.**

- a- pyrometer
- c- voltmeter

- b- barometer
- d- ammeter



- 41- The value of the resistance of an electric conductor in an electric circuit is changed on changing .....**  
 a- dimensions of the conductor.  
 b- electric current intensity passing through it.  
 c- potential difference between its terminals.  
 d- other electric circuit components.
- 42- The unit used in measuring electric resistance is .....**  
 a- Ohm  
 b- ampere  
 c- volt  
 d- joule
- 43- Electromotive force is measured in ..... units**  
 a- Ohm  
 b- ampere  
 c- volt  
 d- coulomb
- 44- The unit used in measuring electric current intensity is .....**  
 a- coulomb  
 b- ampere  
 c- volt  
 d- joule
- 45- The apparatus used in measuring electric current intensity is .....**  
 a- ammeter  
 b- voltmeter  
 c- ohmmeter  
 d- no correct answer.
- 46- The apparatus used in measuring potential difference is .....**  
 a- voltmeter  
 b- ammeter  
 c- ohmmeter  
 d- rheostat
- 47- The apparatus used in measuring electric resistance is .....**  
 a- rheostat  
 b- ammeter  
 c- voltmeter  
 d- ohmmeter
- 48- The apparatus used to control the value of electric resistance in circuit is.....**  
 a- ammeter  
 b- voltmeter  
 c- ohmmeter  
 d- rheostat
- 49- The mathematical relation of ohm's law is .....**  
 a-  $V = I \times R$   
 b-  $I = R \times V$   
 c-  $R = I \times V$   
 d- no correct answer
- 50- The unit used to measure the quantity of electricity passing through a circuit is.....**  
 a- volt  
 b- ampere  
 c- ohm  
 d- coulomb
- 51- To generate an alternating electric current, we use the .....**  
 a- rheostat  
 b- dynamo  
 c- ammeter  
 d- ohmmeter
- 52- To generate a direct electric current, we use the .....**  
 a- dry cell  
 b- dynamo  
 c- ammeter  
 d- ohmmeter
- 53- Alternating current is characterized by .....**  
 a- constant intensity  
 b- variable direction  
 c- variable intensity and direction  
 d- variable intensity.

54- In dry cell, ..... energy is converted to electric energy

- a- magnetic                      b- kinetic  
c- chemical                      d- light

55- In dynamo, ..... energy is converted to electric energy

- a- magnetic                      b- kinetic  
c- chemical                      d- light

56- Four similar electric cell, each has e.m.f 1.5 volt is connected in series, the total e.m.f equals ..... volt

- a- 3                      b- 6                      c- 1.5                      d- 12

57- The scientist who discovers radioactivity phenomena was .....

- a- Ohm                      b- Becryl  
c- Ampere                      d- Mendel

58- The measuring unit of the absorbed radiation is .....

- a- Becqueril                      b- Rem sievert  
c- Roentgen                      d- Ampere

59- On heating copper hydroxide we obtain .....

- a- Copper carbonate and water                      b- Copper oxide and water  
c- Copper and hydrogen.                      d- Copper and oxygen.

60- The hormone which stimulates the storage of glucose sugar in liver is the.....

- a- Insulin                      b- thyroxin  
c- estrogen                      d- parathormone

61- The two factors of the hereditary trait are similar in the .....individual

- a- Pure                      b- Hybrid  
c- recessive                      d- Pure and recessive

62- The ..... hormone releases the needed energy from the food stuffs

- a- Growth                      b- Estrogen  
c- Thyroxin                      d- Insulin

63- The sliding Rheostat is used to change ..... and ..... in the electric circuit.

- a- The current intensity and potential difference  
b- The resistance and potential difference  
c- Current intensity and resistance  
d- Electromotive force and potential difference.

64- The .....hormone responsible for producing secondary sexual female characteristics

- a- Growth                      b- Thyroxin  
c- Estrogen                      d- Insulin

65- The hormone responsible for producing secondary sexual male characteristics

is.....hormone.

- a- Growth                      b- Adrenalin  
c- Progesterone                      d- testosterone.



**4- Give reasons for:**

- 1- Sodium replaces hydrogen of the acids.
- 2- Reactions of iron fillings with dilute hydrochloric acid is faster than its reaction with a piece of iron.
- 3- Rate of chemical reaction is increased by increasing the reactants concentration.
- 4- Radiation has genetic effects.
- 5- Alternating current is preferred than the direct one.
- 6- Rheostat is used in some electric circuits.
- 7- Voltmeter is connected in parallel between two poles of battery.
- 8- Copper does not react with dilute hydrochloric acid.
- 9- The region selected for saving radioactive wastes must be stable.
- 10- Finely divided nickel is used in hydrogenation of oils.
- 11- Fridge is used in preservation of foods.
- 12- The steel scourer used in cleaning aluminum burns faster in a cylinder full of oxygen than its burning in air.
- 13- Ionic compounds react faster than covalent ones.
- 14- Uranium is one of radioactive elements.
- 15- Mendel chosen pea plant for his experiments.
- 16- The pituitary gland is called the master gland or the main gland.
- 17- Pancreas is a double function gland.

**5- What would happen when ....?**

- 1- Heating of sodium nitrate.....
- 2- Putting a piece of sodium in water.....
- 3- Putting a piece of magnesium in copper sulphate solution.....
- 4- Exposing a man for a large amount of atomic radiation for a short period of time.  
.....
- 5- Heating of red mercuric oxide.....
- 6- Heating of blue copper hydroxide.....
- 7- Ammeter and voltmeter reading used in verifying Ohms law if the resistance is burnt.  
.....
- 8- The secretion of thyroxin hormone is increase.  
.....
- 9- The pancreas decreases its secretion of glucagon hormone.  
.....
- 10- The secretion of growth hormone is increase at childhood.  
.....

**6- State the contributions of the following scientists:**

- 1- Ohm:.....
- 2- Henry Becquerel:.....
- 3- Ali Mostafa Mosharafa:.....
- 4- Mendel:.....
- 5- Watson and Crick:.....
- 6- Badel and Tatum:.....

**7- Show by balanced chemical equations each of the following:****A- Effect of heat on:**

- 1- Red mercuric oxide.....
- 2- Sodium nitrate.....
- 3- Copper hydroxide.....
- 4- Copper carbonate.....
- 5- Copper sulphate.....



**B- Effect of adding hydrochloric acid to:**

- 1- Zinc metal.....
- 2- Sodium hydroxide.....
- 3- Sodium carbonate.....

**8- Mention one function only for each of the following:**

- 1- Catalyst (in chemical reaction).....
- 2- Rheostat.....
- 3- Radioactive elements in medicine.....
- 4- Voltmeter.....
- 5- Ammeter.....
- 6- Ohmmeter.....

**9- "Nuclear energy is used in peace purposes"**

Mention their most important uses in each of the following fields :

- |                 |                               |
|-----------------|-------------------------------|
| 1-Medicine..... | 2-Agriculture.....            |
| 3-Industry..... | 4-Generating electricity..... |

**10- If the potential difference** between the two terminals of a conductor is **6 volts**, and the electric current of intensity **0.5 ampere** is passed through it. Calculate the intensity of the electric current passing through this conductor if it is connected with a voltage source of **12 volts**.

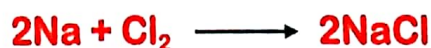
**11- Calculate the quantity of electricity** that pass through a conductor of resistance **2200 ohms** for **two minutes**, given the potential difference between its two terminals is **220 volts**.

**12- You have four electric cell** each of emf **1.5 volt**. Show by drawing the method of connecting them to obtain each of the following:

- |                              |                             |                               |
|------------------------------|-----------------------------|-------------------------------|
| 1- A battery of emf 1.5volt. | 2- A battery of emf 3 volt. | 3- A battery of emf 4.5 volt. |
|------------------------------|-----------------------------|-------------------------------|

**13- From the following reaction Show the:**

Oxidation process – Reduction process – Reducing agent – Oxidizing agent.



## 2- Alternating.

( ..... )



2) Using symbols to express the results of mating between a short stemmed pea plant (tt) and a long stemmed pea plant (TT)

3) When a pea plant that has tall stem is crossed with a pea plant that has short stem, this crossing produce individuals with the ratio of 50% tall : 50 % short what is the genetic structure of parents and producing individuals (use "T" for tall "t" for short)

4- Calculate the current intensity that flow through a wire if the electric charge equals 20 coulombs in a time 4 seconds.

5- Calculate the time of transferring of electric charges = 60 coulombs in an electric circuit if the current intensity = 0.25 amperes.

6- Calculate the work done by a battery its e.m.f = 12 volts to transfer an electric charge of 2.5 coulomb in an electric circuit.

7- An electric appliance works with a potential difference 220 volts and electric resistance 20 Ohm. Calculate current intensity and amount of electric charges through 5 sec.

**19) Mention one function only for each of the following:**

1- Enzymes

2- Oxidase enzyme

3- Catalyst

4- Rheostat

5- Radioactive elements in agriculture



**Model answers****1- Complete the following:**

1. sodium nitrite-oxygen
2. Endocrine glands
3. Hormone.
4. oxidation
5. thermal decomposition
6. oxidizing agent
7. 100%
8. slow
9. Dwarfism
10. increasing
11. coulomb
12. ohm
13. ohmmeter-voltmeter
14. (Nature of reactants) <sup>of reaction</sup> (temperature) <sup>concentration of reactants</sup> (catalyst)
15. Direct - Alternating
16. Mechanical (kinetic) - Electric
17. copper oxide - water
18.  $\text{CuO} + \text{CO}_2$
19.  $3\text{H}_2$
20. oxidase
21. Breaking down bond - forming new bond.
22. capital letters - small letters
23. Discover - treatment of cancer.
24. copper
25. silver chloride
26. Nuclear fuel for rockets
27. Electric resistance.
28. Fixed (constant) - variable (rheostat)
29. Electromotive force.
30. ohm
31. Genetic
32. Rem  $\times$  sievert
33. gametes
34. concurrent

37. Acquired

38. Mendel - Pea - Bisexual <sup>hermaphrodite</sup>

39. Watson - crick

40. Badel and tatum

41. Gene

42. two spiral

43. Direct - Alternating

44. seven

45. Rheostat

46.  $5/1$  millisievert per year

47. change structure of hemoglobin

48. small

49. large - short

50. uranium

51. Nucleus

52. Dominant- recessive

53. insulin

54. Glucagon

55. Electromotive force - volt

56. voltammeter - volt

57. High - low

58. kinetic - electric

**2) Scientific term:-**

1. Reducing agent
2. chemical reactions
3. Neutralization
4. Substitution
5. the speed of chemical reaction
6. catalyst
7. ohm's law
8. voltmeter
9. electric potential
10. electric resistance
11. rem  $\times$  sievert



35. Direct – Alternating  
36. increase – decreases

12. natural radioactivity  
13. electric current  
14. electric resistance  
15. ohm  
16. ampere  
17. volt  
18. hormone disorder  
19. potential difference ✕  
20. oxidizing agent  
21. the speed of chemical reaction  
22. chemical activity series  
23. Double substitution reactions  
24. Isotopes  
25. Dominant traits  
26. chromosome  
27. Hereditary  
28. electromotive force  
29. series  
30. radio activity  
32. physical changes  
33. Genes  
34. Gene  
35. Gametes  
36. rem sievert  
37. electric resistance  
38. feedback mechanism ✕  
39. endocrine glands  
40. pituitary gland  
41. simple goiter Exophthalmic goiter  
42. hormones

### B- compare between:

Series	Parallel
High	Low

Ionic compound	Covalent compound
Fast	Slow

Direct	Alternative
Battery	Dynamo
Electro plating	Lightning houses

I	V	R
Ammeter	Voltmeter	ohmmeter
Ampere	Volt	ohm

### 3- Choose the correct answer:

1. D	18. A	35. C	52. A
2. C	19. B	36. A	53. C
3. D	20. C	37. D	54. C
4. D	21. A	38. A	55. B
5. A	22. B	39. D	56. B
6. B	23. A	40. C	57. B
7. A	24. C	41. A	58. B
8. A	25. A	42. A	59. B
9. B	26. B	43. C	60. A
10. C	27. A	44. B	61. D
11. A	28. B	45. A	62. C
12. C	29. C	46. A	63. A
13. D	30. D	47. D	64. C
14. C	31. B	48. D	65. D
15. C	32. C	49. A	
16. D	33. D	50. D	
17. A	34. D	51. C	

**4- Give reasons for:**

- 1- **Because** sodium is more active than hydrogen of acid and comes before it in chemical activity series then it can replace it
- 2- **Due to** increasing surface area of iron fillings than piece of iron
 
$$Fe + 2HCl \xrightarrow{dil} FeCl_2 + H_2$$
- 3- **Due to** increasing the collision between reactant molecules
- 4- **Because** radiation causes changes in the sex chromosomes composition for living organisms
- 5- **Because:** it can transfer for long distances.
  - It can be changed into a direct current
- 6- **To** control the electric current intensity passing the circuit and the potential difference in the different parts of the circuit
- 7- **To** measure the electromotive force of the battery.
- 8- **Because** copper is less active than hydrogen of acid and comes after it in chemical activity series to prevent the spread of radiation to other areas
- 9- **To** prevent the spread of radiation to other areas.
- 10- **Because** the speed of chemical reactions increases by increasing the surface area
- 11- **Because** the low temperature in the fridge slows down the speed of the chemical reactions done by bacteria which cause the rot of food.
- 12- **Due to** increasing the speed of chemical reaction by increasing concentration of oxygen gas.
- 13- **Because** the reaction of ionic compounds take place between ions, while



14- **Because** the nucleus of its atom contains a number of neutrons more than the number required for its atom stability.

15- **Due to:** - It is easy to be planted and it grows fast.

- Its life cycle is short.

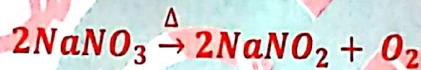
- Its flower is hermaphrodite, so it is can be self-pollinated.

16 - **Because** it secretes hormones that regulate the activities of other endocrine glands.

17- **Because** the pancreas secretes the insulin and glucagon hormones and they have opposite functions in regulating the sugar level in the blood.

### 5- What happen.....?

1- A yellowish white substance of sodium nitrite is formed and Sulphur trioxide gas evolves.



2- An ignition occurs accompanied by a strong pop sound



3- The blue color of copper sulphate disappears and red precipitate of copper is formed



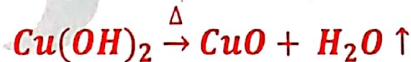
#### 4- It may damage of:

- Bone marrow- spleen – digestive system - Central nervous system

5- A silvery precipitate of mercury is formed and O<sub>2</sub> gas evolve



6- A black substance of copper oxide is formed and water vapour



7- If the resistance isn't burnt, the current will not pass in the circuit, so the reading of ammeter= zero and reading of voltmeter is equal to the electromotive force of the battery.

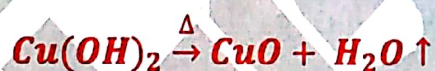
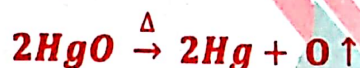
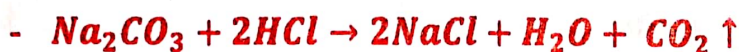
8- Man will suffer from exophthalmic goiter.

9- The level of glucose sugar in blood decreases.

10- Man will suffer from gigantism.

**6- Contribution of scientist:**

<b>Ohm</b>	He deduced the relation between current intensity and potential difference $I \propto V$
<b>Henri Becquerel</b>	He discovered the radioactivity phenomenon
<b>Dr.Aly mostafa moshrafa</b>	He has great theories in the fields of atom and radiation basic of manufacturing the atomic bomb were based on his theories
<b>Mendel</b>	He is the founder of heredity
<b>Watson and crick</b>	They make a model of DNA molecule which is composed of two strands coiled around each other formed double helix shape
<b>Badel and tatum</b>	They discovered the means of how the gens control the appearance of genetic traits

**7- A- Effect of heat on:****B-Effect of adding HCl:**



**8- Mention function:**

- 1- **Catalyst:** they change the speed of chemical reaction
- 2- **Rheostat:** control the current intensity and potential difference in the electric circuit.
- 3- **Radioactive elements in medicine:** treatment and diagnose disease like cancer.
- 4- **Voltmeter:** measuring potential difference and electro motive force the battery.
- 5- **Ammeter:** measuring electric current intensity
- 6- **Ohmmeter:** measuring the electric resistance.

9)

The field	The use
1- Medical field	To treat and diagnose diseases like cancer.
2- Agricultural field	To eliminate pests and to improve some races.
3- Industrial field	- To convert sand to silicon sheets which is used in manufacturing of computer processors of electric appliances.
4- Electricity generation field	The nuclear energy is used to heat water to produce steam. this steam is used to operate turbines to and generate electricity

10)

$V=6 \text{ volts}$

$I=0.5 \text{ amp}$

$V=12 \text{ volts}$

$$R = \frac{V}{I} = \frac{6}{0.5} = 12 \text{ ohm}$$

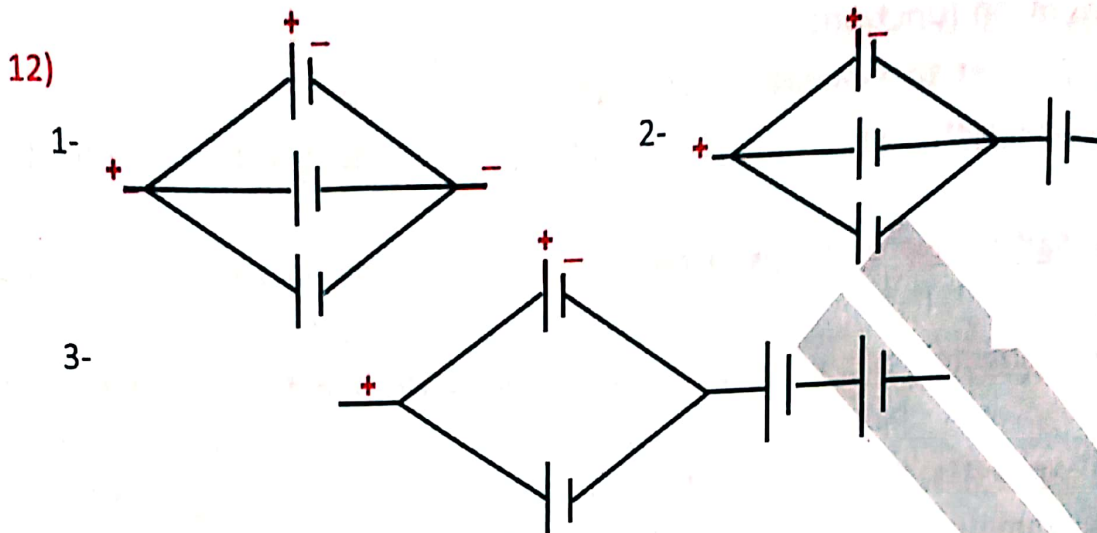
$$I = \frac{V}{R} = \frac{12}{12} = 1 \text{ ampere}$$

11)

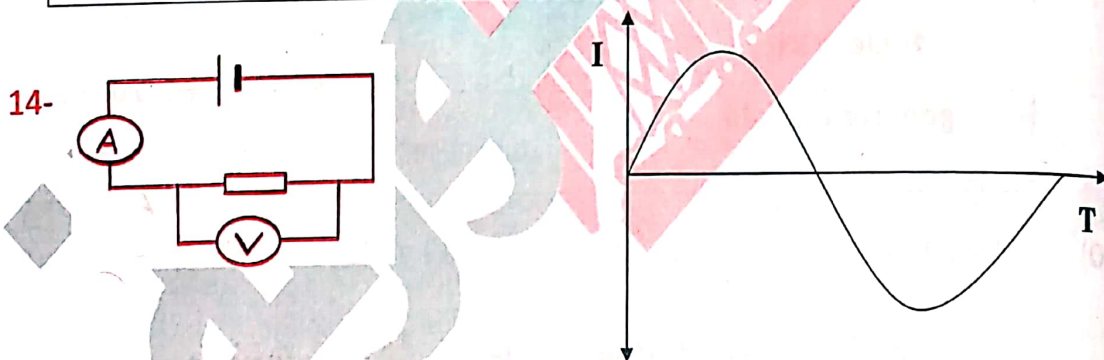
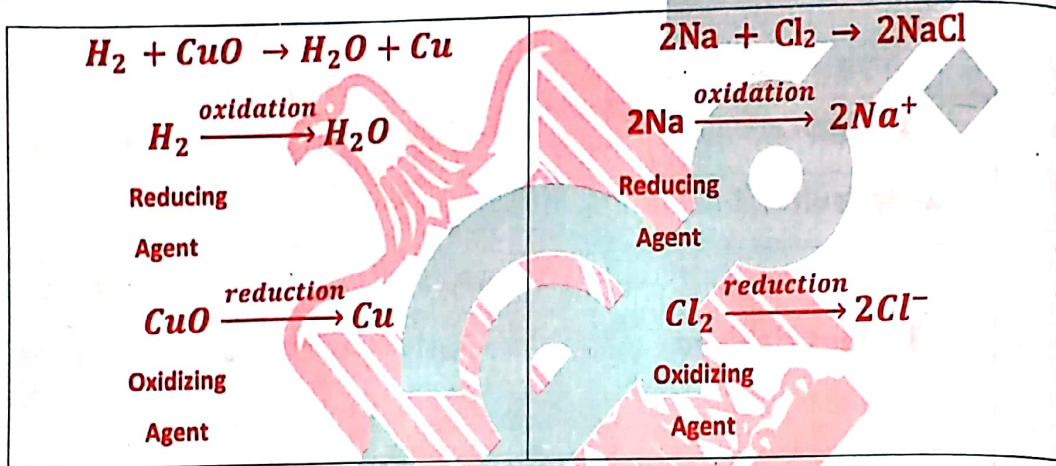
$Q = ? \quad R = 2200 \text{ ohm} \quad T = 2 \times 60 = 120 \text{ sec} \quad V = 220 \text{ volts}$

$$I = \frac{V}{R} = \frac{220}{2200} = 0.1 \text{ ampere}$$

$$q = I \times t = 0.1 \times 120 = 12 \text{ coulomb.}$$

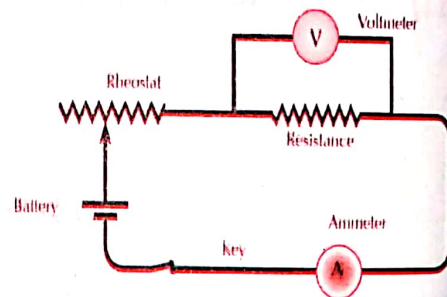


13)



15) Electric current intensity is directly proportional the potential difference across it at a constant temperature.

$$V = I \times R$$





16) **Steps:**

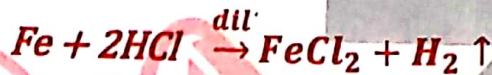
- 1- Bring two flasks, then put in one of them iron fillings and in the other a piece of iron has the same mass
- 2- pour equal amount of dil .HCl acid in both flasks
- 3- Compare between the speeds of the two reactions.

**Observation:**

The rate of reaction of HCl. with iron filing is faster than that in case of piece of iron

**Conclusion:**

The speed of chemical reaction increases by increasing the surface area of the reactant exposed to the reaction.



17) 1-Oxidation - Reduction reaction

2-Double substitution reaction (Neutralization)

3- Simple substitution reaction

18) 1- a-  $SO_3$  b-  $CuO$  c-  $H_2$  d-  $Cu$  e- Thermal decomposition reaction

2-

Parent

TT	×	tt
----	---	----

Segregation Gametes

T	t
---	---

First generation

Tt
----

Ratio 100% are of hybrid long stems

Parent 2

Tt	×	Tt
----	---	----

Segregation Gametes

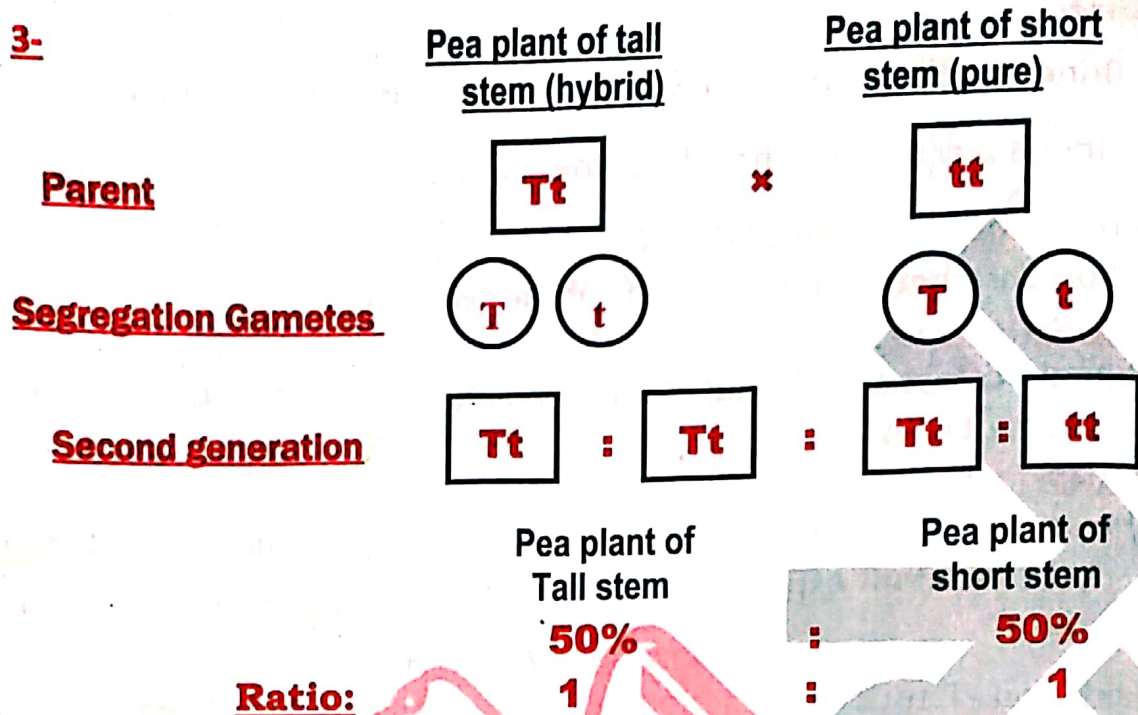
T	t	T	t
---	---	---	---

Second generation

TT	:	Tt	:	Tt	:	tt
----	---	----	---	----	---	----

3 Tall : 1 Short.

3-



4-  $I = \frac{q}{t} = \frac{20}{4} = 5 \text{ ampere}$

5-  $T = \frac{q}{i} = \frac{60}{0.25} = 240 \text{ seconds}$

6-  $W = v \times q = 0.25 \times 12 = 30 \text{ joules.}$

7-  $V = 220 \text{ volt}$

$R = 20 \text{ ohm}$

$I = ?$

$t = 5 \text{ sec}$

$$I = \frac{v}{R} = \frac{220}{20} = 11 \text{ ampere}$$

19)

**1-Enzymes:** they act as catalyst that increases the speed of biological reactions.

**2-Oxidase enzymes** increases the speed of the decomposing of hydrogen peroxide

**3-Catalyst:** increase or decreases the speed of chemical reaction.

**4-Rheostat:** control electric current intensity and potential differences